

SEQUENCE LISTING

<110> MacKinnon, Roderick
The Rockefeller University

<120> Assays for Screening Compounds Which Interact With
Cation Channel Proteins, Mutant Prokaryotic Cation
Channel Proteins, and Uses Thereof

<130> 018512-002901US

<140> US 09/275,252

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<150> WO PCT/US99/06307

<151> 1999-03-22

<160> 42

<170> PatentIn Ver. 2.1

<210> 1

<211> 160

<212> PRT

<213> Streptomyces lividans

<400> 1

Met Pro Pro Met Leu Ser Gly Leu Leu Ala Arg Leu Val Lys Leu Leu
1 5 10 15

Leu Gly Arg His Gly Ser Ala Leu His Trp Arg Ala Ala Gly Ala Ala
20 25 30

Thr Val Leu Leu Val Ile Val Leu Leu Ala Gly Ser Tyr Leu Ala Val
35 40 45

Leu Ala Glu Arg Gly Ala Pro Gly Ala Gln Leu Ile Thr Tyr Pro Arg
50 55 60

Ala Leu Trp Trp Ser Val Glu Thr Ala Thr Thr Val Gly Tyr Gly Asp
65 70 75 80

Leu Tyr Pro Val Thr Leu Trp Gly Arg Leu Val Ala Val Val Val Met
85 90 95

Val Ala Gly Ile Thr Ser Phe Gly Leu Val Thr Ala Ala Leu Ala Thr
100 105 110

Trp Phe Val Gly Arg Glu Gln Glu Arg Arg Gly His Phe Val Arg His
115 120 125

Ser Glu Lys Ala Ala Glu Glu Ala Tyr Thr Arg Thr Thr Arg Ala Leu
130 135 140

His Glu Arg Phe Asp Arg Leu Glu Arg Met Leu Asp Asp Asn Arg Arg
 145 150 155 160

<210> 2

<211> 417

<212> PRT

<213> Escherichia coli

<400> 2

Met Ser His Trp Thr Thr Phe Lys Gln Thr Ala Thr Lys Leu Trp Val
 1 5 10 15

Thr Leu Arg His Asp Ile Leu Ala Leu Ala Val Phe Leu Asn Gly Leu
 20 25 30

Leu Ile Phe Lys Thr Ile Tyr Gly Met Ser Val Asn Leu Leu Asp Ile
 35 40 45

Phe His Ile Lys Ala Phe Ser Glu Leu Asp Leu Ser Leu Leu Ala Asn
 50 55 60

Ala Pro Leu Phe Met Leu Gly Val Phe Leu Val Leu Asn Ser Ile Gly
 65 70 75 80

Leu Leu Phe Arg Ala Lys Leu Ala Trp Ala Ile Ser Ile Ile Leu Leu
 85 90 95

Leu Ile Ala Leu Ile Tyr Thr Leu His Phe Tyr Pro Trp Leu Lys Phe
 100 105 110

Ser Ile Gly Phe Cys Ile Phe Thr Leu Val Phe Leu Leu Ile Leu Arg
 115 120 125

Lys Asp Phe Ser His Ser Ser Ala Ala Ala Gly Thr Ile Phe Ala Phe
 130 135 140

Ile Ser Phe Thr Thr Leu Leu Phe Tyr Ser Thr Tyr Gly Ala Leu Tyr
 145 150 155 160

Leu Ser Glu Gly Phe Asn Pro Arg Ile Glu Ser Leu Met Thr Ala Phe
 165 170 175

Tyr Phe Ser Ile Glu Thr Met Ser Thr Val Gly Tyr Gly Asp Ile Val
 180 185 190

Pro Val Ser Glu Ser Ala Arg Leu Phe Thr Ile Ser Val Ile Ile Ser
 195 200 205

Gly Ile Thr Val Phe Ala Thr Ser Met Thr Ser Ile Phe Gly Pro Leu
 210 215 220

Ile Arg Gly Gly Phe Asn Lys Leu Val Lys Gly Asn Asn His Thr Met
 225 230 235 240

His Arg Lys Asp His Phe Ile Val Cys Gly His Ser Ile Leu Ala Ile
 245 250 255

Asn Thr Ile Leu Gln Leu Asn Gln Arg Gly Gln Asn Val Thr Val Ile
 260 265 270

Ser Asn Leu Pro Glu Asp Asp Ile Lys Gln Leu Glu Gln Arg Leu Gly
 275 280 285
 Asp Asn Ala Asp Val Ile Pro Gly Asp Ser Asn Asp Ser Ser Val Leu
 290 295 300
 Lys Lys Ala Gly Ile Asp Arg Cys Arg Ala Ile Leu Ala Leu Ser Asp
 305 310 315 320
 Asn Asp Ala Asp Asn Ala Phe Val Val Leu Ser Ala Lys Asp Met Ser
 325 330 335
 Ser Asp Val Lys Thr Val Leu Ala Val Ser Asp Ser Lys Asn Leu Asn
 340 345 350
 Lys Ile Lys Met Val His Pro Asp Ile Ile Leu Ser Pro Gln Leu Phe
 355 360 365
 Gly Ser Glu Ile Leu Ala Arg Val Leu Asn Gly Glu Glu Ile Asn Asn
 370 375 380
 Asp Met Leu Val Ser Met Leu Leu Asn Ser Gly His Gly Ile Phe Ser
 385 390 395 400
 Asp Asn Asp Glu Gln Glu Thr Lys Ala Asp Ser Lys Glu Ser Ala Gln
 405 410 415

Lys

<210> 3
 <211> 58
 <212> PRT
 <213> Clostridium acetobutylicum

<400> 3
 Ser Leu Gly Asn Ala Leu Trp Trp Ser Phe Val Thr Ile Thr Thr Val
 1 5 10 15
 Gly Tyr Gly Asp Ile Ser Pro Ser Thr Pro Phe Gly Arg Val Ile Ala
 20 25 30
 Ser Ile Leu Met Leu Ile Gly Ile Gly Phe Leu Ser Met Leu Thr Gly
 35 40 45
 Thr Ile Ser Thr Phe Phe Ile Ser Lys Lys
 50 55

<210> 4
 <211> 616
 <212> PRT
 <213> Drosophila melanogaster

<400> 4
 Met Ala Ala Val Ala Gly Leu Tyr Gly Leu Gly Glu Asp Arg Gln His
 1 5 10 15
 Arg Lys Lys Gln Gln Gln Gln Gln His Gln Lys Glu Gln Leu Glu
 20 25 30

Gln Lys Glu Glu Gln Lys Lys Ile Ala Glu Arg Lys Leu Gln Leu Arg
 35 40 45
 Glu Gln Gln Leu Gln Arg Asn Ser Leu Asp Gly Tyr Gly Ser Leu Pro
 50 55 60
 Lys Leu Ser Ser Gln Asp Glu Glu Gly Gly Ala Gly His Gly Phe Gly
 65 70 75 80
 Gly Gly Pro Gln His Phe Glu Pro Ile Pro His Asp His Asp Phe Cys
 85 90 95
 Glu Arg Val Val Ile Asn Val Ser Gly Leu Arg Phe Glu Thr Gln Leu
 100 105 110
 Arg Thr Leu Asn Gln Phe Pro Asp Thr Leu Leu Gly Asp Pro Ala Arg
 115 120 125
 Arg Leu Arg Tyr Phe Asp Pro Leu Arg Asn Glu Tyr Phe Phe Asp Arg
 130 135 140
 Ser Arg Pro Ser Phe Asp Ala Ile Leu Tyr Tyr Tyr Gln Ser Gly Gly
 145 150 155 160
 Arg Leu Arg Arg Pro Val Asn Val Pro Leu Asp Val Phe Ser Glu Glu
 165 170 175
 Ile Lys Phe Tyr Glu Leu Gly Asp Gln Ala Ile Asn Lys Phe Arg Glu
 180 185 190
 Asp Glu Gly Phe Ile Lys Glu Glu Glu Arg Pro Leu Pro Asp Asn Glu
 195 200 205
 Lys Gln Arg Lys Val Trp Leu Leu Phe Glu Tyr Pro Glu Ser Ser Gln
 210 215 220
 Ala Ala Arg Val Val Ala Ile Ile Ser Val Phe Val Ile Leu Leu Ser
 225 230 235 240
 Ile Val Ile Phe Cys Leu Glu Thr Leu Pro Glu Phe Lys His Tyr Lys
 245 250 255
 Val Phe Asn Thr Thr Thr Asn Gly Thr Lys Ile Glu Glu Asp Glu Val
 260 265 270
 Pro Asp Ile Thr Asp Pro Phe Phe Leu Ile Glu Thr Leu Cys Ile Ile
 275 280 285
 Trp Phe Thr Phe Glu Leu Thr Val Arg Phe Leu Ala Cys Pro Asn Lys
 290 295 300
 Leu Asn Phe Cys Arg Asp Val Met Asn Val Ile Asp Ile Ile Ala Ile
 305 310 315 320
 Ile Pro Tyr Phe Ile Thr Leu Ala Thr Val Val Ala Glu Glu Glu Asp
 325 330 335
 Thr Leu Asn Leu Pro Lys Ala Pro Val Ser Pro Gln Asp Lys Ser Ser
 340 345 350

Asn Gln Ala Met Ser Leu Ala Ile Leu Arg Val Ile Arg Leu Val Arg
 355 360 365
 Val Phe Arg Ile Phe Lys Leu Ser Arg His Ser Lys Gly Leu Gln Ile
 370 375 380
 Leu Gly Arg Thr Leu Lys Ala Ser Met Arg Glu Leu Gly Leu Leu Ile
 385 390 395 400
 Phe Phe Leu Phe Ile Gly Val Val Leu Phe Ser Ser Ala Val Tyr Phe
 405 410 415
 Ala Glu Ala Gly Ser Glu Asn Ser Phe Phe Lys Ser Ile Pro Asp Ala
 420 425 430
 Phe Trp Trp Ala Val Val Thr Met Thr Thr Val Gly Tyr Gly Asp Met
 435 440 445
 Thr Pro Val Gly Phe Trp Gly Lys Ile Val Gly Ser Leu Cys Val Ile
 450 455 460
 Ala Gly Val Leu Thr Ile Ala Leu Pro Val Pro Val Ile Val Ser Asn
 465 470 475 480
 Phe Asn Tyr Phe Tyr His Arg Glu Ala Asp Arg Glu Glu Met Gln Ser
 485 490 495
 Gln Asn Phe Asn His Val Thr Ser Cys Ser Tyr Leu Pro Gly Ala Leu
 500 505 510
 Gly Gln His Leu Lys Lys Ser Ser Leu Ser Glu Ser Ser Ser Asp Ile
 515 520 525
 Met Asp Leu Asp Asp Gly Ile Asp Ala Thr Thr Pro Gly Leu Thr Asp
 530 535 540
 His Thr Gly Arg His Met Val Pro Phe Leu Arg Thr Gln Gln Ser Phe
 545 550 555 560
 Glu Lys Gln Gln Leu Gln Leu Gln Leu Gln Leu Gln Gln Ser Gln
 565 570 575
 Ser Pro His Gly Gln Gln Met Thr Gln Gln Gln Gln Leu Gly Gln Asn
 580 585 590
 Gly Leu Arg Ser Thr Asn Ser Leu Gln Leu Arg His Asn Asn Ala Met
 595 600 605
 Ala Val Ser Ile Glu Thr Asp Val
 610 615

<210> 5

<211> 495

<212> PRT

<213> Homo sapiens

<400> 5

Met Thr Val Met Ser Gly Glu Asn Val Asp Glu Ala Ser Ala Ala Pro
 1 5 10 15

Gly His Pro Gln Asp Gly Ser Tyr Pro Arg Gln Ala Asp His Asp Asp
 20 25 30
 His Glu Cys Cys Glu Arg Val Val Ile Asn Ile Ser Gly Leu Arg Phe
 35 40 45
 Glu Thr Gln Leu Lys Thr Leu Ala Gln Phe Pro Asn Thr Leu Leu Gly
 50 55 60
 Asn Pro Lys Lys Arg Met Arg Tyr Phe Asp Pro Leu Arg Asn Glu Tyr
 65 70 75 80
 Phe Phe Asp Arg Asn Arg Pro Ser Phe Asp Ala Ile Leu Tyr Tyr Tyr
 85 90 95
 Gln Ser Gly Gly Arg Leu Arg Arg Pro Val Asn Val Pro Leu Asp Met
 100 105 110
 Phe Ser Glu Glu Ile Lys Phe Tyr Glu Leu Gly Glu Glu Ala Met Glu
 115 120 125
 Lys Phe Arg Glu Asp Glu Gly Phe Ile Lys Glu Glu Glu Arg Pro Leu
 130 135 140
 Pro Glu Lys Glu Tyr Gln Arg Gln Val Trp Leu Leu Phe Glu Tyr Pro
 145 150 155 160
 Glu Ser Ser Gly Pro Ala Arg Val Ile Ala Ile Val Ser Val Met Val
 165 170 175
 Ile Leu Ile Ser Ile Val Ile Phe Cys Leu Glu Thr Leu Pro Glu Leu
 180 185 190
 Lys Asp Asp Lys Asp Phe Thr Gly Thr Val His Arg Ile Asp Asn Thr
 195 200 205
 Thr Val Ile Tyr Asn Ser Asn Ile Phe Thr Asp Pro Phe Phe Ile Val
 210 215 220
 Glu Thr Leu Cys Ile Ile Trp Phe Ser Phe Glu Leu Val Val Arg Phe
 225 230 235 240
 Phe Ala Cys Pro Ser Lys Thr Asp Phe Phe Lys Asn Ile Met Asn Phe
 245 250 255
 Ile Asp Ile Val Ala Ile Ile Pro Tyr Phe Ile Thr Leu Gly Thr Glu
 260 265 270
 Ile Ala Glu Gln Glu Gly Asn Gln Lys Gly Glu Gln Ala Thr Ser Leu
 275 280 285
 Ala Ile Leu Arg Val Ile Arg Leu Val Arg Val Phe Arg Ile Phe Lys
 290 295 300
 Leu Ser Arg His Ser Lys Gly Leu Gln Ile Leu Gly Gln Thr Leu Lys
 305 310 315 320
 Ala Ser Met Arg Glu Leu Gly Leu Leu Ile Phe Phe Leu Phe Ile Gly
 325 330 335

Val Ile Leu Phe Ser Ser Ala Val Tyr Phe Ala Glu Ala Glu Glu Ala
 340 345 350
 Glu Ser His Phe Ser Ser Ile Pro Asp Ala Phe Trp Trp Ala Val Val
 355 360 365
 Ser Met Thr Thr Val Gly Tyr Gly Asp Met Tyr Pro Val Thr Ile Gly
 370 375 380
 Gly Lys Ile Val Gly Ser Leu Cys Ala Ile Ala Gly Val Leu Thr Ile
 385 390 395 400
 Ala Leu Pro Val Pro Val Ile Val Ser Asn Phe Asn Tyr Phe Tyr His
 405 410 415
 Arg Glu Thr Glu Gly Glu Glu Gln Ala Gln Leu Leu His Val Ser Ser
 420 425 430
 Pro Asn Leu Ala Ser Asp Ser Asp Leu Ser Arg Arg Ser Ser Ser Thr
 435 440 445
 Met Ser Lys Tyr Glu Tyr Met Glu Ile Glu Glu Asp Met Asn Asn Ser
 450 455 460
 Ile Ala His Tyr Arg Gln Val Asn Ile Arg Thr Ala Asn Cys Thr Thr
 465 470 475 480
 Ala Asn Gln Asn Cys Val Asn Lys Ser Lys Leu Leu Thr Asp Val
 485 490 495

<210> 6
 <211> 858
 <212> PRT
 <213> Homo sapiens

<400> 6
 Met Pro Ala Gly Met Thr Lys His Gly Ser Arg Ser Thr Ser Ser Leu
 1 5 10 15
 Pro Pro Glu Pro Met Glu Ile Val Arg Ser Lys Ala Cys Ser Arg Arg
 20 25 30
 Val Arg Leu Asn Val Gly Gly Leu Ala His Glu Val Leu Trp Arg Thr
 35 40 45
 Leu Asp Arg Leu Pro Arg Thr Arg Leu Gly Lys Leu Arg Asp Cys Asn
 50 55 60
 Thr His Asp Ser Leu Leu Glu Val Cys Asp Asp Tyr Ser Leu Asp Asp
 65 70 75 80
 Asn Glu Tyr Phe Phe Asp Arg His Pro Gly Ala Phe Thr Ser Ile Leu
 85 90 95
 Asn Phe Tyr Arg Thr Gly Arg Leu His Met Met Glu Glu Met Cys Ala
 100 105 110
 Leu Ser Phe Ser Gln Glu Leu Asp Tyr Trp Gly Ile Asp Glu Ile Tyr
 115 120 125

Leu 130	Glu	Ser	Cys	Cys	Gln	Ala	Arg	Tyr	His	Gln	Lys	Lys	Glu	Gln	Met
Asn 145	Glu	Glu	Leu	Lys	Arg	Glu	Ala	Glu	Thr	Leu	Arg	Glu	Arg	Glu	Gly 160
Glu	Glu	Phe	Asp	Asn 165	Thr	Cys	Cys	Ala	Glu 170	Lys	Arg	Lys	Lys	Leu 175	Trp
Asp	Leu	Leu	Glu 180	Lys	Pro	Asn	Ser	Ser 185	Val	Ala	Ala	Lys	Ile 190	Leu	Ala
Ile	Ile	Ser 195	Ile	Met	Phe	Ile	Val 200	Leu	Ser	Thr	Ile	Ala 205	Leu	Ser	Leu
Asn 210	Thr	Leu	Pro	Glu	Leu	Gln 215	Ser	Leu	Asp	Glu	Phe 220	Gly	Gln	Ser	Thr
Asp 225	Asn	Pro	Gln	Leu	Ala 230	His	Val	Glu	Ala	Val 235	Cys	Ile	Ala	Trp	Phe 240
Thr	Met	Glu	Tyr	Leu 245	Leu	Arg	Phe	Leu	Ser 250	Ser	Pro	Lys	Lys	Trp 255	Lys
Phe	Phe	Lys	Gly 260	Pro	Leu	Asn	Ala 265	Ile	Asp	Leu	Leu	Ala 270	Ile	Leu	Pro
Tyr	Tyr	Val 275	Thr	Ile	Phe	Leu	Thr 280	Glu	Ser	Asn	Lys	Ser 285	Val	Leu	Gln
Phe 290	Gln	Asn	Val	Arg	Arg	Val 295	Val	Gln	Ile	Phe	Arg 300	Ile	Met	Arg	Ile
Leu 305	Arg	Ile	Leu	Lys	Leu 310	Ala	Arg	His	Ser	Thr 315	Gly	Leu	Gln	Ser	Leu 320
Gly	Phe	Thr	Leu	Arg 325	Arg	Ser	Tyr	Asn	Glu 330	Leu	Gly	Leu	Leu	Ile 335	Leu
Phe	Leu	Ala 340	Met	Gly	Ile	Met	Ile 345	Phe	Ser	Ser	Leu	Val 350	Phe	Phe	Ala
Glu	Lys	Asp 355	Glu	Asp	Asp	Thr	Lys 360	Phe	Lys	Ser	Ile	Pro 365	Ala	Ser	Phe
Trp 370	Trp	Ala	Thr	Ile	Thr	Met 375	Thr	Thr	Val	Gly 380	Tyr	Gly	Asp	Ile	Tyr
Pro 385	Lys	Thr	Leu	Leu	Gly 390	Lys	Ile	Val	Gly 395	Gly	Leu	Cys	Cys	Ile	Ala 400
Gly	Val	Leu	Val	Ile 405	Ala	Leu	Pro	Ile 410	Pro	Ile	Ile	Val	Asn	Asn 415	Phe
Ser	Glu	Phe	Tyr 420	Lys	Glu	Gln	Lys	Arg 425	Gln	Glu	Lys	Ala	Ile 430	Lys	Arg
Arg	Glu	Ala 435	Leu	Glu	Arg	Ala	Lys 440	Arg	Asn	Gly 445	Ser	Ile	Val	Ser	Met

Asn Met Lys Asp Ala Phe Ala Arg Ser Ile Glu Met Met Asp Ile Val
 450 455 460
 Val Glu Lys Asn Gly Glu Asn Met Gly Lys Lys Asp Lys Val Gln Asp
 465 470 475 480
 Asn His Leu Ser Pro Asn Lys Trp Lys Trp Thr Lys Arg Thr Leu Ser
 485 490 495
 Glu Thr Ser Ser Ser Lys Ser Phe Glu Thr Lys Glu Gln Gly Ser Pro
 500 505 510
 Glu Lys Ala Arg Ser Ser Ser Ser Pro Gln His Leu Asn Val Gln Gln
 515 520 525
 Leu Glu Asp Met Tyr Asn Lys Met Ala Lys Thr Gln Ser Gln Pro Ile
 530 535 540
 Leu Asn Thr Lys Glu Ser Ala Ala Gln Ser Lys Pro Lys Glu Glu Leu
 545 550 555 560
 Glu Met Glu Ser Ile Pro Ser Pro Val Ala Pro Leu Pro Thr Arg Thr
 565 570 575
 Glu Gly Val Ile Asp Met Arg Ser Met Ser Ser Ile Asp Ser Phe Ile
 580 585 590
 Ser Cys Ala Thr Asp Phe Pro Glu Ala Thr Arg Phe Ser His Ser Pro
 595 600 605
 Leu Thr Ser Leu Pro Ser Lys Thr Gly Gly Ser Thr Ala Pro Glu Val
 610 615 620
 Gly Trp Arg Gly Ala Leu Gly Ala Ser Gly Gly Arg Phe Val Glu Ala
 625 630 635 640
 Asn Pro Ser Pro Asp Ala Ser Gln His Ser Ser Phe Phe Ile Glu Ser
 645 650 655
 Pro Lys Ser Ser Met Lys Thr Asn Asn Pro Leu Lys Leu Arg Ala Leu
 660 665 670
 Lys Val Asn Phe Met Glu Gly Asp Pro Ser Pro Leu Leu Pro Val Leu
 675 680 685
 Gly Met Tyr His Asp Pro Leu Arg Asn Arg Gly Ser Ala Ala Ala Ala
 690 695 700
 Val Ala Gly Leu Glu Cys Ala Thr Leu Leu Asp Lys Ala Val Leu Ser
 705 710 715 720
 Pro Glu Ser Ser Ile Tyr Thr Thr Ala Ser Ala Lys Thr Pro Pro Arg
 725 730 735
 Ser Pro Glu Lys His Thr Ala Ile Ala Phe Asn Phe Glu Ala Gly Val
 740 745 750
 His Gln Tyr Ile Asp Ala Asp Thr Asp Asp Glu Gly Gln Leu Leu Tyr
 755 760 765

Ser Val Asp Ser Ser Pro Pro Lys Ser Leu Pro Gly Ser Thr Ser Pro
 770 775 780

Lys Phe Ser Thr Gly Thr Arg Ser Glu Lys Asn His Phe Glu Ser Ser
 785 790 795 800

Pro Leu Pro Thr Ser Pro Lys Phe Leu Arg Gln Asn Cys Ile Tyr Ser
 805 810 815

Thr Glu Ala Leu Thr Gly Lys Gly Pro Ser Gly Gln Glu Lys Cys Lys
 820 825 830

Leu Glu Asn His Ile Ser Pro Asp Val Arg Val Leu Pro Gly Gly Gly
 835 840 845

Ala His Gly Ser Thr Arg Asp Gln Ser Ile
 850 855

<210> 7
 <211> 597
 <212> PRT
 <213> Paramecium tetraurelia

<400> 7
 Met Gly Pro Lys Ile Arg Ala Ile Ser Phe Gln Ser Asn Lys Pro Met
 1 5 10 15

Met Asn Leu Lys Glu Asp Ser Pro Val Phe Ile Asp Ser His Thr Asp
 20 25 30

His Val Gly Phe Ser Asn Lys Ile Trp Arg Thr Lys Ala Leu Glu Ile
 35 40 45

Leu Met Ile Thr Leu Arg Phe Ile Ser Phe Ile Thr Lys Ser Asn Phe
 50 55 60

Ala Thr Ser Phe Lys Leu Ile Asn Lys Asn Val Phe Glu Ile Ile Gly
 65 70 75 80

Asp Val Ser Ala Asp Phe Thr Tyr Tyr Leu Leu Lys Asn Phe Phe Lys
 85 90 95

Tyr Glu Lys Pro Thr Gly Phe Gln Lys Gly Gln His Phe Leu Asn Gln
 100 105 110

Thr Leu Leu Ile Pro Leu Arg Lys Thr Lys Leu Leu Lys Ile Tyr Cys
 115 120 125

Gly Asn Gln Lys Leu Ile Met Arg Pro Glu Ser Leu Ala Ser Ile Trp
 130 135 140

Trp Asn Ile Tyr Ile Leu Thr Ile Leu Asn Ile Asn Val Leu Tyr Val
 145 150 155 160

Ser Ile Lys Ile Ala Phe Lys Phe Asp Glu Gln Ser Gln Asp Asp Phe
 165 170 175

Tyr Gln Ala Arg Gln Ile Ile Phe Asp Val Leu Pro Ser Tyr Ser Phe
 180 185 190

Met Leu Glu Ile Leu Leu Lys Phe Asn Thr Cys Tyr Tyr Tyr Lys Gly
 195 200 205
 Ala Val Ile Glu Asn Arg Tyr Gln Ile Ala Lys Asn Tyr Leu Arg Ser
 210 215 220
 Ser Phe Phe Phe Asp Ile Phe Val Val Ile Pro Tyr Phe Ile Ser Leu
 225 230 235 240
 Arg Phe Asp Leu Gln Tyr Leu Asp Leu Val Ile Ile Leu Lys Val Phe
 245 250 255
 Gln Ile Thr Lys Phe Ser Arg Asn Leu Phe Asp Arg Leu Glu Leu Thr
 260 265 270
 Ala Ile Gln Ile Val Ile Val Asp Leu Val Lys Leu Gly Tyr Thr Ile
 275 280 285
 Leu Ala Ala Ala His Phe Ser Ala Cys Ile Trp Phe Leu Val Gly Ser
 290 295 300
 Thr Gly Asn Pro Asn Asp Thr Ser Trp Ile Lys Ala Gln Asn Ile Glu
 305 310 315 320
 Asn Glu Gln Trp Phe Asn Gln Tyr Leu His Ser Leu Tyr Trp Ser Ile
 325 330 335
 Ile Thr Met Thr Thr Ile Gly Tyr Gly Asp Ile Thr Pro Gln Asn Leu
 340 345 350
 Arg Glu Arg Val Phe Ala Val Gly Met Ala Leu Ser Ala Val Gly Val
 355 360 365
 Phe Gly Tyr Ser Ile Gly Asn Ile Asn Ser Ile Tyr Ala Glu Trp Ser
 370 375 380
 Arg Gln Ser Phe Gln Ile Arg Thr Asp Met Asn Asn Leu Lys Lys Phe
 385 390 395 400
 Ile Arg Ile Lys Gly Ile Asn Lys His Leu Ala Glu Lys Ile Arg Lys
 405 410 415
 Tyr Phe Glu Tyr Val Trp Ser Asp Gln Met Glu Asp Asn Asp Arg Glu
 420 425 430
 Val Tyr Lys Phe Ser Glu Met Ile Pro Lys Gln Leu Ala Glu Glu Met
 435 440 445
 Lys Ile Asp Thr Asn Met Lys Leu Ile Gln Lys Asn Ser Phe Leu Val
 450 455 460
 Asn Asn Phe Ser Glu Gln Phe Leu Ile Ser Leu Ser Lys Val Leu Ile
 465 470 475 480
 Glu Glu Lys Tyr Val Pro Glu Ser Thr Ile Tyr Leu Val Lys Leu Ile
 485 490 495
 Asn Ile Leu Gln Gln Asn Asp Pro Ser Asn Tyr Leu Tyr Ile Leu Ser
 500 505 510

Asn Gly Ser Leu Ser Phe Tyr Ile Thr Leu Asn Asn Lys Gln Gln Thr
 515 520 525
 Ile Lys Val Leu Glu Thr Ile Lys Asn Glu Gly Gln Ala Phe Gly Val
 530 535 540
 Leu Glu Phe Phe Gln Ser Gln Ala Tyr Gln Val Ser Cys Lys Ser Asn
 545 550 555 560
 Gln Phe Ser Tyr Val Leu Lys Ile Asp Lys Ser Gln Phe Met Glu Ile
 565 570 575
 Ile Ser Gln His Lys Asn Asp Tyr Val Thr Gln Ile Ile Tyr Leu Ile
 580 585 590
 Leu Val Gln Ile Leu
 595

<210> 8
 <211> 556
 <212> PRT
 <213> *Caenorhabditis elegans*

<400> 8
 Asp Ala Cys Ser Phe Asn Arg Phe Asp Ser Asn Arg Ser Ser Ala Arg
 1 5 10 15
 Arg Phe Ser Arg Arg Gly Ser Asp Tyr Phe Gly Asp Lys Gly Ile Ser
 20 25 30
 Met Asp Glu Arg Ile Val Leu Asn Val Gly Gly Val Arg His Glu Thr
 35 40 45
 Tyr Gln Ala Thr Leu Lys Lys Ile Pro Ala Thr Arg Leu Ser Arg Leu
 50 55 60
 Thr Pro Ser Leu Ala Asn Phe Asp Pro Leu Leu Asn Glu Tyr Phe Phe
 65 70 75 80
 Asp Arg His Pro Ala Val Phe Ala Met Ile Leu Asn Tyr Tyr Arg Thr
 85 90 95
 Gly Lys Leu His Tyr Pro Thr Asp Val Cys Gly Pro Leu Phe Glu Glu
 100 105 110
 Glu Leu Gln Tyr Trp Gly Leu Asp Ala Ser Asp Thr Glu Pro Cys Cys
 115 120 125
 Trp Met Gln Leu Leu His Ala Lys Asp Thr Gln Glu Thr Leu Ala Val
 130 135 140
 Leu Asp Arg Met Asp Ala Asp His Glu Asp Asp Pro Gln Leu Arg Glu
 145 150 155 160
 Gln Asp Thr Met Lys Lys Phe Gly Trp Glu Glu Asp Tyr Phe Gln Gly
 165 170 175
 Lys Arg Thr Arg Trp Met Lys Leu Lys Pro Gln Met Trp Ser Leu Phe
 180 185 190

Asp Glu Pro Tyr Ser Ser Gln Ala Ala Lys Leu Ile Ala Gly Ile Ser
 195 200 205
 Val Leu Phe Ile Phe Ile Ser Ile Phe Ser Phe Cys Leu Lys Thr His
 210 215 220
 Gln Ser Phe Arg Leu Pro Val Leu Ile Gly Gln Asn Ile Thr Met Pro
 225 230 235 240
 Gly Gly Val Val Gln Pro Ser Ile Glu Arg Val Ser Thr Glu Pro Leu
 245 250 255
 Pro Ile Phe Gly Gln Ile Glu Met Leu Cys Asn Ile Trp Phe Thr Leu
 260 265 270
 Glu Leu Ile Ile Arg Phe Val Phe Cys Pro Ser Lys Ile Arg Phe Phe
 275 280 285
 Lys Ser Pro Leu Asn Met Ile Asp Leu Val Ala Thr Leu Ser Phe Tyr
 290 295 300
 Ala Asp Ala Met Met Val Arg Val Val Glu Asp Glu Pro Lys Asp Val
 305 310 315 320
 Val Glu Phe Leu Ser Met Ile Arg Ile Phe Arg Leu Phe Lys Leu Thr
 325 330 335
 Gln His His Gln Gly Leu Gln Ile Leu Ile His Thr Phe Arg Ala Ser
 340 345 350
 Ala Lys Glu Leu Ile Leu Leu Val Phe Phe Leu Ile Leu Gly Ile Val
 355 360 365
 Ile Phe Ala Ala Leu Val Tyr Tyr Ala Glu Lys Met Glu Ala Asn Pro
 370 375 380
 Asn Asn Gln Phe Gln Ser Ile Pro Leu Gly Leu Trp Trp Ala Ile Cys
 385 390 395 400
 Thr Met Thr Thr Val Gly Tyr Gly Asp Met Thr Pro His Thr Ser Phe
 405 410 415
 Gly Arg Leu Val Gly Ser Leu Cys Ala Val Met Gly Val Leu Thr Ile
 420 425 430
 Ala Leu Pro Val Pro Val Ile Val Ser Asn Phe Ala Met Phe Tyr Ser
 435 440 445
 His Asn Gln Ala Arg Asp Lys Leu Pro Lys Arg Arg Arg Arg Val Leu
 450 455 460
 Pro Val Glu Gln Ile Arg Leu Gln Ala Arg Arg His Ala Ala Val Leu
 465 470 475 480
 Glu Pro Ser Ala Ser Gln Gly Gly Leu Gly Gly Gly Gln Ala Ile Arg
 485 490 495
 Arg Arg Asn Met Pro Ile Leu Ile Asp Gln Asn Cys Cys Asp Glu Glu
 500 505 510

Asn His Asn His Lys Asp Arg Glu Lys Ser Glu Asn Ser Asp Glu Gly
515 520 525

Thr Asn Ser Ser Ser Thr Thr Gly Val Asp Thr Val Val Lys Leu Gly
530 535 540

Pro Ser Glu Thr Ala Ile Thr Thr Thr Ile Ile Ser
545 550 555

<210> 9

<211> 1196

<212> PRT

<213> Mus musculus

<400> 9

Met Glu Leu Glu His Pro Lys Ser Pro Pro Tyr Pro Ser Ser Ser Ser
1 5 10 15

Ser Ser Ser Ser Ser Ser Val His Glu Pro Lys Met Asp Ala Leu Ile
20 25 30

Ile Pro Val Thr Met Glu Val Pro Cys Asp Ser Arg Gly Gln Arg Met
35 40 45

Trp Trp Ala Phe Leu Ala Ser Ser Met Val Thr Phe Phe Gly Gly Leu
50 55 60

Phe Ile Ile Leu Leu Trp Arg Thr Leu Lys Tyr Leu Trp Thr Val Cys
65 70 75 80

Cys His Cys Gly Gly Lys Thr Lys Glu Ala Gln Lys Ile Asn Asn Gly
85 90 95

Ser Ser Gln Ala Asp Gly Thr Leu Lys Pro Val Asp Glu Lys Glu Glu
100 105 110

Val Val Ala Ala Glu Val Gly Trp Met Thr Ser Val Lys Asp Trp Ala
115 120 125

Gly Val Met Ile Ser Ala Gln Thr Leu Thr Gly Arg Val Leu Val Val
130 135 140

Leu Val Phe Ala Leu Ser Ile Gly Ala Leu Val Ile Tyr Phe Ile Asp
145 150 155 160

Ser Ser Asn Pro Ile Glu Ser Cys Gln Asn Phe Tyr Lys Asp Phe Thr
165 170 175

Leu Gln Ile Asp Met Ala Phe Asn Val Phe Phe Leu Leu Tyr Phe Gly
180 185 190

Leu Arg Phe Ile Ala Ala Asn Asp Lys Leu Trp Phe Trp Leu Glu Val
195 200 205

Asn Ser Val Val Asp Phe Phe Thr Val Pro Pro Val Phe Val Ser Val
210 215 220

Tyr Leu Asn Arg Ser Trp Leu Gly Leu Arg Phe Leu Arg Ala Leu Arg
225 230 235 240

Leu Ile Gln Phe Ser Glu Ile Leu Gln Phe Leu Asn Ile Leu Lys Thr
 245 250 255
 Ser Asn Ser Ile Lys Leu Val Asn Leu Leu Ser Ile Phe Ile Ser Thr
 260 265 270
 Trp Leu Thr Ala Ala Gly Phe Ile His Leu Val Glu Asn Ser Gly Asp
 275 280 285
 Pro Trp Glu Asn Phe Gln Asn Asn Gln Ala Leu Thr Tyr Trp Glu Cys
 290 295 300
 Val Tyr Leu Leu Met Val Thr Met Ser Thr Val Gly Tyr Gly Asp Val
 305 310 315 320
 Tyr Ala Lys Thr Thr Leu Gly Arg Leu Phe Met Val Phe Phe Ile Leu
 325 330 335
 Gly Gly Leu Ala Met Phe Ala Ser Tyr Val Pro Glu Ile Ile Glu Leu
 340 345 350
 Ile Gly Asn Arg Lys Lys Tyr Gly Gly Ser Tyr Ser Ala Val Ser Gly
 355 360 365
 Arg Lys His Ile Val Val Cys Gly His Ile Thr Leu Glu Ser Val Ser
 370 375 380
 Asn Phe Leu Lys Asp Phe Leu His Lys Asp Arg Asp Asp Val Asn Val
 385 390 395 400
 Glu Ile Val Phe Leu His Asn Ile Ser Pro Asn Leu Glu Leu Glu Ala
 405 410 415
 Leu Phe Lys Arg His Phe Thr Gln Val Glu Phe Tyr Gln Gly Ser Val
 420 425 430
 Leu Asn Pro His Asp Leu Ala Arg Val Lys Ile Glu Ser Ala Asp Ala
 435 440 445
 Cys Leu Ile Leu Ala Asn Lys Tyr Cys Ala Asp Pro Asp Ala Glu Asp
 450 455 460
 Ala Ser Asn Ile Met Arg Val Ile Ser Ile Lys Asn Tyr His Pro Lys
 465 470 475 480
 Ile Arg Ile Ile Thr Gln Met Leu Gln Tyr His Asn Lys Ala His Leu
 485 490 495
 Leu Asn Ile Pro Ser Trp Asn Trp Lys Glu Gly Asp Asp Ala Ile Cys
 500 505 510
 Leu Ala Glu Leu Lys Leu Gly Phe Ile Ala Gln Ser Cys Leu Ala Gln
 515 520 525
 Gly Leu Ser Thr Met Leu Ala Asn Leu Phe Ser Met Arg Ser Phe Ile
 530 535 540
 Lys Ile Glu Glu Asp Thr Trp Gln Lys Tyr Tyr Leu Glu Gly Val Ser
 545 550 555 560

Asn	Glu	Met	Tyr	Thr	Glu	Tyr	Leu	Ser	Ser	Ala	Phe	Val	Gly	Leu	Ser	
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Phe	Pro	Thr	Val	Cys	Glu	Leu	Cys	Phe	Val	Lys	Leu	Lys	Leu	Leu	Met	
			580					585					590			
Ile	Ala	Ile	Glu	Tyr	Lys	Ser	Ala	Asn	Arg	Glu	Ser	Arg	Ile	Leu	Ile	
		595					600					605				
Asn	Pro	Gly	Asn	His	Leu	Lys	Ile	Gln	Glu	Gly	Thr	Leu	Gly	Phe	Phe	
	610					615					620					
Ile	Ala	Ser	Asp	Ala	Lys	Glu	Val	Lys	Arg	Ala	Phe	Phe	Tyr	Cys	Lys	
625					630					635					640	
Ala	Cys	His	Asp	Asp	Val	Thr	Asp	Pro	Lys	Arg	Ile	Lys	Lys	Cys	Gly	
				645					650					655		
Cys	Arg	Arg	Leu	Ile	Tyr	Phe	Glu	Asp	Glu	Gln	Pro	Pro	Thr	Leu	Ser	
			660					665					670			
Pro	Lys	Lys	Lys	Gln	Arg	Asn	Gly	Gly	Met	Arg	Asn	Ser	Pro	Asn	Thr	
	675						680					685				
Ser	Pro	Lys	Leu	Met	Arg	His	Asp	Pro	Leu	Leu	Ile	Pro	Gly	Asn	Asp	
	690					695					700					
Gln	Ile	Asp	Asn	Met	Asp	Ser	Asn	Val	Lys	Lys	Tyr	Asp	Ser	Thr	Gly	
705				710						715					720	
Met	Phe	His	Trp	Cys	Ala	Pro	Lys	Glu	Ile	Glu	Lys	Val	Ile	Leu	Thr	
			725					730						735		
Arg	Ser	Glu	Ala	Ala	Met	Thr	Val	Leu	Ser	Gly	His	Val	Val	Val	Cys	
			740					745					750			
Ile	Phe	Gly	Asp	Val	Ser	Ser	Ala	Leu	Ile	Gly	Leu	Arg	Asn	Leu	Val	
		755					760					765				
Met	Pro	Leu	Arg	Ala	Ser	Asn	Phe	His	Tyr	His	Glu	Leu	Lys	His	Ile	
	770					775					780					
Val	Phe	Val	Gly	Ser	Ile	Glu	Tyr	Leu	Lys	Arg	Glu	Trp	Glu	Thr	Leu	
785					790					795					800	
His	Asn	Phe	Pro	Lys	Val	Ser	Ile	Leu	Pro	Gly	Thr	Pro	Leu	Ser	Arg	
				805					810					815		
Ala	Asp	Leu	Arg	Ala	Val	Asn	Ile	Asn	Leu	Cys	Asp	Met	Cys	Val	Ile	
			820					825					830			
Leu	Ser	Ala	Asn	Gln	Asn	Asn	Ile	Asp	Asp	Thr	Ser	Leu	Gln	Asp	Lys	
		835					840					845				
Glu	Cys	Ile	Leu	Ala	Ser	Leu	Asn	Ile	Lys	Ser	Met	Gln	Phe	Asp	Asp	
	850					855					860					
Ser	Ile	Gly	Val	Leu	Gln	Ala	Asn	Ser	Gln	Gly	Phe	Thr	Pro	Pro	Gly	
865					870					875					880	

Met	Asp	Arg	Ser	Ser	Pro	Asp	Asn	Ser	Pro	Val	His	Gly	Met	Leu	Arg	885	890	895	
Gln	Pro	Ser	Ile	Thr	Thr	Gly	Val	Asn	Ile	Pro	Ile	Ile	Thr	Glu	Leu	900	905	910	
Val	Asn	Asp	Thr	Asn	Val	Gln	Phe	Leu	Asp	Gln	Asp	Asp	Asp	Asp	Asp	915	920	925	
Pro	Asp	Thr	Glu	Leu	Tyr	Leu	Thr	Gln	Pro	Phe	Ala	Cys	Gly	Thr	Ala	930	935	940	
Phe	Ala	Val	Ser	Val	Leu	Asp	Ser	Leu	Met	Ser	Ala	Thr	Tyr	Phe	Asn	945	950	955	960
Asp	Asn	Ile	Leu	Thr	Leu	Ile	Arg	Thr	Leu	Val	Thr	Gly	Gly	Ala	Thr	965	970	975	
Pro	Glu	Leu	Glu	Ala	Leu	Ile	Ala	Glu	Glu	Asn	Ala	Leu	Arg	Gly	Gly	980	985	990	
Tyr	Ser	Thr	Pro	Gln	Thr	Leu	Ala	Asn	Arg	Asp	Arg	Cys	Arg	Val	Ala	995	1000	1005	
Gln	Leu	Ala	Leu	Leu	Asp	Gly	Pro	Phe	Ala	Asp	Leu	Gly	Asp	Gly	Gly	1010	1015	1020	
Cys	Tyr	Gly	Asp	Leu	Phe	Cys	Lys	Ala	Leu	Lys	Thr	Tyr	Asn	Met	Leu	1025	1030	1035	1040
Cys	Phe	Gly	Ile	Tyr	Arg	Leu	Arg	Asp	Ala	His	Leu	Ser	Thr	Pro	Ser	1045	1050	1055	
Gln	Cys	Thr	Lys	Arg	Tyr	Val	Ile	Thr	Asn	Pro	Pro	Tyr	Glu	Phe	Glu	1060	1065	1070	
Leu	Val	Pro	Thr	Asp	Leu	Ile	Phe	Cys	Leu	Met	Gln	Phe	Asp	His	Asn	1075	1080	1085	
Ala	Gly	Gln	Ser	Arg	Ala	Ser	Leu	Ser	His	Ser	Ser	His	Ser	Ser	Gln	1090	1095	1100	
Ser	Ser	Ser	Lys	Lys	Ser	Ser	Ser	Val	His	Ser	Ile	Pro	Ser	Thr	Ala	1105	1110	1115	1120
Asn	Arg	Pro	Asn	Arg	Pro	Lys	Ser	Arg	Glu	Ser	Arg	Asp	Lys	Gln	Asn	1125	1130	1135	
Ala	Thr	Arg	Met	Thr	Arg	Met	Gly	Gln	Ala	Glu	Lys	Lys	Trp	Phe	Thr	1140	1145	1150	
Asp	Glu	Pro	Asp	Asn	Ala	Tyr	Pro	Arg	Asn	Ile	Gln	Ile	Lys	Pro	Met	1155	1160	1165	
Ser	Thr	His	Met	Ala	Asn	Gln	Ile	Asn	Gln	Tyr	Lys	Ser	Thr	Ser	Ser	1170	1175	1180	
Leu	Ile	Pro	Pro	Ile	Arg	Glu	Val	Glu	Asp	Glu	Cys					1185	1190	1195	

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<400> 10

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Met Asp Thr Ser Gly His Phe His Asp Ser Gly Val Gly Asp Leu Asp
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Glu Asp Pro Lys Cys Pro Cys Pro Ser Ser Gly Asp Glu Gln Gln Gln
          20           25           30

Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Pro Pro Pro Pro Ala Ser Pro
          35           40           45

Ala Ala Pro Gln Gln Pro Leu Gly Pro Ser Leu Gln Pro Gln Pro Pro
          50           55           60

Gln Leu Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln Gln
          65           70           75           80

Ser Pro His Pro Leu Ser Gln Leu Ala Gln Leu Gln Ser Gln Pro Val
          85           90           95

His Pro Gly Leu Leu His Ser Ser Pro Thr Ala Phe Arg Ala Pro Pro
          100          105          110

Ser Ser Asn Ser Thr Ala Ile Leu His Pro Ser Ser Arg Gln Gly Ser
          115          120          125

Gln Leu Asn Leu Asn Asp His Leu Leu Gly His Ser Pro Ser Ser Thr
          130          135          140

Ala Thr Ser Gly Pro Gly Gly Gly Ser Arg His Arg Gln Ala Ser Pro
          145          150          155          160

Leu Val His Arg Arg Asp Ser Asn Pro Phe Thr Glu Ile Ala Met Ser
          165          170          175

Ser Cys Lys Tyr Ser Gly Gly Val Met Lys Pro Leu Ser Arg Phe Ser
          180          185          190

Ala Ser Arg Arg Asn Leu Ile Glu Ala Glu Thr Glu Gly Gln Pro Leu
          195          200          205

Gln Leu Phe Ser Pro Ser Asn Pro Pro Glu Ile Val Ile Ser Ser Arg
          210          215          220

Glu Asp Asn His Ala His Gln Thr Leu Leu His His Pro Asn Ala Thr
          225          230          235          240

His Asn His Gln His Ala Gly Thr Thr Ala Ser Ser Thr Thr Phe Pro
          245          250          255

Lys Ala Asn Lys Arg Lys Asn Gln Asn Ile Gly Tyr Lys Leu Gly His
          260          265          270

Arg Arg Ala Leu Phe Glu Lys Arg Lys Arg Leu Ser Asp Tyr Ala Leu
          275          280          285

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Ile	Phe	Gly	Met	Phe	Gly	Ile	Val	Val	Met	Val	Ile	Glu	Thr	Glu	Leu	290	295	300
Ser	Trp	Gly	Leu	Tyr	Ser	Lys	Asp	Ser	Met	Phe	Ser	Leu	Ala	Leu	Lys	305	310	315
Cys	Arg	Ile	Ser	Leu	Ser	Thr	Ile	Ile	Leu	Leu	Gly	Leu	Ile	Ile	Ala	325	330	335
Tyr	His	Thr	Arg	Gly	Val	Gln	Leu	Phe	Val	Ile	Asp	Asn	Asp	Ala	Asp	340	345	350
Asp	Trp	Arg	Ile	Ala	Met	Thr	Tyr	Glu	Arg	Ile	Leu	Tyr	Ile	Ser	Leu	355	360	365
Glu	Met	Leu	Val	Tyr	Thr	Asn	His	Thr	Ile	Pro	Gly	Glu	Tyr	Lys	Phe	370	375	380
Phe	Trp	Ala	Ala	Arg	Leu	Ala	Phe	Ser	Tyr	Thr	Pro	Ser	Arg	Ala	Glu	385	390	395
Ala	Asp	Val	Asp	Ile	Ile	Leu	Ser	Ile	Pro	Met	Phe	Leu	Arg	Leu	Tyr	405	410	415
Leu	Ile	Ala	Arg	Val	Met	Leu	Leu	His	Ser	Lys	Leu	Phe	Thr	Asp	Ala	420	425	430
Ser	Ser	Arg	Ser	Ile	Gly	Ala	Leu	Asn	Lys	Ile	Asn	Phe	Asn	Thr	Arg	435	440	445
Phe	Val	Met	Lys	Thr	Leu	Met	Thr	Ile	Cys	Pro	Gly	Thr	Val	Leu	Leu	450	455	460
Val	Phe	Ser	Ile	Ser	Leu	Trp	Ile	Ile	Ala	Ala	Trp	Thr	Val	Arg	Val	465	470	475
Cys	Glu	Arg	Tyr	His	Asp	Gln	Gln	Asp	Val	Thr	Ser	Asn	Phe	Leu	Gly	485	490	495
Ala	Met	Trp	Leu	Ile	Ser	Ile	Thr	Phe	Leu	Ser	Ile	Gly	Tyr	Gly	Asp	500	505	510
Met	Val	Pro	His	Thr	Tyr	Cys	Gly	Lys	Gly	Val	Cys	Leu	Leu	Thr	Gly	515	520	525
Ile	Met	Gly	Ala	Gly	Cys	Thr	Ala	Leu	Val	Val	Ala	Val	Val	Ala	Arg	530	535	540
Lys	Leu	Glu	Leu	Thr	Lys	Ala	Glu	Lys	His	Val	Asp	Asn	Phe	Met	Met	545	550	555
Asp	Thr	Gln	Leu	Thr	Lys	Arg	Ile	Lys	Asn	Ala	Ala	Ala	Asn	Val	Leu	565	570	575
Arg	Glu	Thr	Trp	Leu	Ile	Tyr	Lys	His	Thr	Lys	Leu	Leu	Lys	Lys	Ile	580	585	590
Asp	His	Ala	Lys	Val	Arg	Lys	His	Gln	Arg	Lys	Phe	Leu	Gln	Ala	Ile	595	600	605

His Gln Leu Arg Ser Val Lys Met Glu Gln Arg Lys Leu Ser Asp Gln
610 615 620

Ala Asn Thr Leu Val Asp Leu Ser Lys Met Gln Asn Val Met Tyr Asp
625 630 635 640

Leu Ile Thr Glu Leu Asn Asp Arg Ser Glu Asp Leu Glu Lys Gln Ile
645 650 655

Gly Ser Leu Glu Ser Lys Leu Glu His Leu Thr Ala Ser Phe Asn Ser
660 665 670

Leu Pro Leu Leu Ile Ala Asp Thr Leu Arg Gln Gln Gln Gln Gln Leu
675 680 685

Leu Ser Ala Ile Ile Glu Ala Arg Gly Val Ser Val Ala Val Gly Thr
690 695 700

Thr His Thr Pro Ile Ser Asp Thr Pro Ile Gly Val Ser Ser Thr Ser
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Phe Pro Thr Pro Tyr Thr Ser Ser Ser Ser Cys
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<212> PRT

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Gln Leu Ser Arg Glu Ser Ser His Phe Ser Leu Ser Thr Gly Ile Leu
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Pro Ser Leu Gly Ala Arg Ser Asn Arg Arg Val Lys Leu Arg Arg Phe
35 40 45

Val Val Ser Pro Tyr Asp His Lys Tyr Arg Ile Trp Glu Ala Phe Leu
50 55 60

Val Val Leu Val Val Tyr Thr Ala Trp Val Ser Pro Phe Glu Phe Gly
65 70 75 80

Phe Leu Arg Lys Pro Arg Pro Pro Leu Ser Ile Thr Asp Asn Ile Val
85 90 95

Asn Ala Phe Phe Ala Ile Asp Ile Ile Met Thr Phe Phe Val Gly Tyr
100 105 110

Leu Asp Lys Ser Thr Tyr Leu Ile Val Asp Asp Arg Lys Gln Ile Ala
115 120 125

Phe Lys Tyr Leu Arg Ser Trp Phe Leu Leu Asp Leu Val Ser Thr Ile
130 135 140

Pro Ser Glu Ala Ala Met Arg Ile Ser Ser Gln Ser Tyr Gly Leu Phe
145 150 155 160

Asn	Met	Leu	Arg	Leu	Trp	Arg	Leu	Arg	Arg	Val	Gly	Ala	Leu	Phe	Ala		
				165					170					175			
Arg	Leu	Glu	Lys	Asp	Arg	Asn	Phe	Asn	Tyr	Phe	Trp	Val	Arg	Cys	Ala		
			180					185					190				
Lys	Leu	Val	Cys	Val	Thr	Leu	Phe	Ala	Val	His	Cys	Ala	Ala	Cys	Phe		
		195					200					205					
Tyr	Tyr	Leu	Ile	Ala	Ala	Arg	Asn	Ser	Asn	Pro	Ala	Lys	Thr	Trp	Ile		
	210					215					220						
Gly	Ala	Asn	Val	Ala	Asn	Phe	Leu	Glu	Glu	Ser	Leu	Trp	Met	Arg	Tyr		
225					230					235					240		
Val	Thr	Ser	Met	Tyr	Trp	Ser	Ile	Thr	Thr	Leu	Thr	Thr	Val	Gly	Tyr		
				245					250					255			
Gly	Asp	Leu	His	Pro	Val	Asn	Thr	Lys	Glu	Met	Ile	Phe	Asp	Ile	Phe		
			260					265					270				
Tyr	Met	Leu	Phe	Asn	Leu	Gly	Leu	Thr	Ala	Tyr	Leu	Ile	Gly	Asn	Met		
		275					280					285					
Thr	Asn	Leu	Val	Val	His	Gly	Thr	Ser	Arg	Thr	Arg	Asn	Phe	Arg	Asp		
	290					295					300						
Thr	Ile	Gln	Ala	Ala	Ser	Asn	Phe	Ala	His	Arg	Asn	His	Leu	Pro	Pro		
305					310					315				320			
Arg	Leu	Gln	Asp	Gln	Met	Leu	Ala	His	Leu	Cys	Leu	Lys	Tyr	Arg	Thr		
				325					330					335			
Asp	Ser	Glu	Gly	Leu	Gln	Gln	Gln	Glu	Thr	Leu	Asp	Ala	Leu	Pro	Lys		
			340					345					350				
Ala	Ile	Arg	Ser	Ser	Ile	Ser	His	Phe	Leu	Phe	Tyr	Ser	Leu	Met	Asp		
		355					360					365					
Lys	Val	Tyr	Leu	Phe	Arg	Gly	Val	Ser	Asn	Asp	Leu	Leu	Phe	Gln	Leu		
	370					375					380						
Val	Ser	Glu	Met	Lys	Ala	Glu	Tyr	Phe	Pro	Pro	Lys	Glu	Asp	Val	Ile		
385					390					395					400		
Leu	Gln	Asn	Glu	Ala	Pro	Thr	Asp	Phe	Tyr	Ile	Leu	Val	Asn	Gly	Thr		
				405					410					415			
Ala	Asp	Leu	Val	Asp	Val	Asp	Thr	Gly	Thr	Glu	Ser	Ile	Val	Arg	Glu		
			420					425					430				
Val	Lys	Ala	Gly	Asp	Ile	Ile	Gly	Glu	Ile	Gly	Val	Leu	Cys	Tyr	Arg		
		435					440					445					
Pro	Gln	Leu	Phe	Thr	Val	Arg	Thr	Lys	Arg	Leu	Cys	Gln	Leu	Leu	Arg		
	450					455					460						
Met	Asn	Arg	Thr	Thr	Phe	Leu	Asn	Ile	Ile	Gln	Ala	Asn	Val	Gly	Asp		
465					470					475					480		

Gly	Thr	Ile	Ile	Met	Asn	Asn	Leu	Leu	Gln	His	Leu	Lys	Glu	Met	Asn	
				485					490					495		
Asp	Pro	Val	Met	Thr	Asn	Val	Leu	Leu	Glu	Ile	Glu	Asn	Met	Leu	Ala	
			500					505					510			
Arg	Gly	Lys	Met	Asp	Leu	Pro	Leu	Asn	Leu	Cys	Phe	Ala	Ala	Ile	Arg	
		515					520					525				
Glu	Asp	Asp	Leu	Leu	Leu	His	Gln	Leu	Leu	Lys	Arg	Gly	Leu	Asp	Pro	
	530					535					540					
Asn	Glu	Ser	Asp	Asn	Asn	Gly	Arg	Thr	Pro	Leu	His	Ile	Ala	Ala	Ser	
545					550					555					560	
Lys	Gly	Thr	Leu	Asn	Cys	Val	Leu	Leu	Leu	Leu	Glu	Tyr	His	Ala	Asp	
				565					570						575	
Pro	Asn	Cys	Arg	Asp	Ala	Glu	Gly	Ser	Val	Pro	Leu	Trp	Glu	Ala	Met	
			580					585					590			
Val	Glu	Gly	His	Glu	Lys	Val	Val	Lys	Val	Leu	Leu	Glu	His	Gly	Ser	
		595					600					605				
Thr	Ile	Asp	Ala	Gly	Asp	Val	Gly	His	Phe	Ala	Cys	Thr	Ala	Ala	Glu	
	610					615					620					
Gln	Gly	Asn	Leu	Lys	Leu	Leu	Lys	Glu	Ile	Val	Leu	His	Gly	Gly	Asp	
625					630					635					640	
Val	Thr	Arg	Pro	Arg	Ala	Thr	Gly	Thr	Ser	Ala	Leu	His	Thr	Ala	Val	
				645					650					655		
Cys	Glu	Glu	Asn	Ile	Glu	Met	Val	Lys	Tyr	Leu	Leu	Glu	Gln	Gly	Ala	
			660					665					670			
Asp	Val	Asn	Lys	Gln	Asp	Met	His	Gly	Trp	Thr	Pro	Arg	Asp	Leu	Ala	
		675					680					685				
Glu	Gln	Gln	Gly	His	Glu	Asp	Ile	Lys	Ala	Leu	Phe	Arg	Glu	Lys	Leu	
	690					695					700					
His	Glu	Arg	Arg	Val	His	Ile	Glu	Thr	Ser	Ser	Ser	Val	Pro	Ile	Leu	
705					710					715					720	
Lys	Thr	Gly	Ile	Arg	Phe	Leu	Gly	Arg	Phe	Thr	Ser	Glu	Pro	Asn	Ile	
				725					730					735		
Arg	Pro	Ala	Ser	Arg	Glu	Val	Ser	Phe	Arg	Ile	Arg	Glu	Thr	Arg	Ala	
			740					745					750			
Arg	Arg	Lys	Thr	Asn	Asn	Phe	Asp	Asn	Ser	Leu	Phe	Gly	Ile	Leu	Ala	
		755					760					765				
Asn	Gln	Ser	Val	Pro	Lys	Asn	Gly	Leu	Ala	Thr	Val	Asp	Glu	Gly	Arg	
	770					775					780					
Thr	Gly	Asn	Pro	Val	Arg	Val	Thr	Ile	Ser	Cys	Ala	Glu	Lys	Asp	Asp	
785					790					795					800	

Ile Ala Gly Lys Leu Val Leu Leu Pro Gly Ser Phe Lys Glu Leu Leu
805 810 815

Glu Leu Gly Ser Asn Lys Phe Gly Ile Val Ala Thr Lys Val Met Asn
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Lys Asp Asn Asn Ala Glu Ile Asp Asp Val Asp Val Ile Arg Asp Gly
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Asp His Leu Ile Phe Ala Thr Asp Ser
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35 40 45

Cys Glu Leu Cys Gly Tyr Ser Arg Ala Glu Val Met Gln Arg Pro Cys
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Thr Cys Asp Phe Leu His Gly Pro Arg Thr Gln Arg Arg Ala Ala Ala
65 70 75 80

Gln Ile Ala Gln Ala Leu Leu Gly Ala Glu Glu Arg Lys Val Glu Ile
85 90 95

Ala Phe Tyr Arg Lys Asp Gly Ser Cys Phe Leu Cys Leu Val Asp Val
100 105 110

Val Pro Val Lys Asn Glu Asp Gly Ala Val Ile Met Phe Ile Leu Asn
115 120 125

Phe Glu Val Val Met Glu Lys Asp Met Val Gly Ser Pro Ala His Asp
130 135 140

Thr Asn His Arg Gly Pro Pro Thr Ser Trp Leu Ala Pro Gly Arg Ala
145 150 155 160

Lys Thr Phe Arg Leu Lys Leu Pro Ala Leu Leu Ala Leu Thr Ala Arg
165 170 175

Glu Ser Ser Val Arg Ser Gly Gly Ala Gly Gly Ala Gly Ala Pro Gly
180 185 190

Ala Val Val Val Asp Val Asp Leu Thr Pro Ala Ala Pro Ser Ser Glu
195 200 205

Ser Leu Ala Leu Asp Glu Val Thr Ala Met Asp Asn His Val Ala Gly
210 215 220

Leu Gly Pro Ala Glu Glu Arg Arg Ala Leu Val Gly Pro Gly Ser Pro
 225 230 235 240
 Pro Arg Ser Ala Pro Gly Gln Leu Pro Ser Pro Arg Ala His Ser Leu
 245 250 255
 Asn Pro Asp Ala Ser Gly Ser Ser Cys Ser Leu Ala Arg Thr Arg Ser
 260 265 270
 Arg Glu Ser Cys Ala Ser Val Arg Arg Ala Ser Ser Ala Asp Asp Ile
 275 280 285
 Glu Ala Met Arg Ala Gly Val Leu Pro Pro Pro Pro Arg His Ala Ser
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 Thr Gly Ala Met His Pro Leu Arg Ser Gly Leu Leu Asn Ser Thr Ser
 305 310 315 320
 Asp Ser Asp Leu Val Arg Tyr Arg Thr Ile Ser Lys Ile Pro Gln Ile
 325 330 335
 Thr Leu Asn Phe Val Asp Leu Lys Gly Asp Pro Phe Leu Ala Ser Pro
 340 345 350
 Thr Ser Asp Arg Glu Ile Ile Ala Pro Lys Ile Lys Glu Arg Thr His
 355 360 365
 Asn Val Thr Glu Lys Val Thr Gln Val Leu Ser Leu Gly Ala Asp Val
 370 375 380
 Leu Pro Glu Tyr Lys Leu Gln Ala Pro Arg Ile His Arg Trp Thr Ile
 385 390 395 400
 Leu His Tyr Ser Pro Phe Lys Ala Val Trp Asp Trp Leu Ile Leu Leu
 405 410 415
 Leu Val Ile Tyr Thr Ala Val Phe Thr Pro Tyr Ser Ala Ala Phe Leu
 420 425 430
 Leu Lys Glu Thr Glu Glu Gly Pro Pro Ala Thr Glu Cys Gly Tyr Ala
 435 440 445
 Cys Gln Pro Leu Ala Val Val Asp Leu Ile Val Asp Ile Met Phe Ile
 450 455 460
 Val Asp Ile Leu Ile Asn Phe Arg Thr Thr Tyr Val Asn Ala Asn Glu
 465 470 475 480
 Glu Val Val Ser His Pro Gly Arg Ile Ala Val His Tyr Phe Lys Gly
 485 490 495
 Trp Phe Leu Ile Asp Met Val Ala Ala Ile Pro Phe Asp Leu Leu Ile
 500 505 510
 Phe Gly Ser Gly Ser Glu Glu Leu Ile Gly Leu Leu Lys Thr Ala Arg
 515 520 525
 Leu Leu Arg Leu Val Arg Val Ala Arg Lys Leu Asp Arg Tyr Ser Glu
 530 535 540

Tyr Gly Ala Ala Val Leu Phe Leu Leu Met Cys Thr Phe Ala Leu Ile
 545 550 555 560
 Ala His Trp Leu Ala Cys Ile Trp Tyr Ala Ile Gly Asn Met Glu Gln
 565 570 575
 Pro His Met Asp Ser Arg Ile Gly Trp Leu His Asn Leu Gly Asp Gln
 580 585 590
 Ile Gly Lys Pro Tyr Asn Ser Ser Gly Leu Gly Gly Pro Ser Ile Lys
 595 600 605
 Asp Lys Tyr Val Thr Ala Leu Tyr Phe Thr Phe Ser Ser Leu Thr Ser
 610 615 620
 Val Gly Phe Gly Asn Val Ser Pro Asn Thr Asn Ser Glu Lys Ile Phe
 625 630 635 640
 Ser Ile Cys Val Met Leu Ile Gly Ser Leu Met Tyr Ala Ser Ile Phe
 645 650 655
 Gly Asn Val Ser Ala Ile Ile Gln Arg Leu Tyr Ser Gly Thr Ala Arg
 660 665 670
 Tyr His Thr Gln Met Leu Arg Val Arg Glu Phe Ile Arg Phe His Gln
 675 680 685
 Ile Pro Asn Pro Leu Arg Gln Arg Leu Glu Glu Tyr Phe Gln His Ala
 690 695 700
 Trp Ser Tyr Thr Asn Gly Ile Asp Met Asn Ala Val Leu Lys Gly Phe
 705 710 715 720
 Pro Glu Cys Leu Gln Ala Asp Ile Cys Leu His Leu Asn Arg Ser Leu
 725 730 735
 Leu Gln His Cys Lys Pro Phe Arg Gly Ala Thr Lys Gly Cys Leu Arg
 740 745 750
 Ala Leu Ala Met Lys Phe Lys Thr Thr His Ala Pro Pro Gly Asp Thr
 755 760 765
 Leu Val His Ala Gly Asp Leu Leu Thr Ala Leu Tyr Phe Ile Ser Arg
 770 775 780
 Gly Ser Ile Glu Ile Leu Arg Gly Asp Val Val Val Ala Ile Leu Gly
 785 790 795 800
 Lys Asn Asp Ile Phe Gly Glu Pro Leu Asn Leu Tyr Ala Arg Pro Gly
 805 810 815
 Lys Ser Asn Gly Asp Val Arg Ala Leu Thr Tyr Cys Asp Leu His Lys
 820 825 830
 Ile His Arg Asp Asp Leu Leu Glu Val Leu Asp Met Tyr Pro Glu Phe
 835 840 845
 Ser Asp His Phe Trp Ser Ser Leu Glu Ile Thr Phe Asn Leu Arg Asp
 850 855 860

Thr Asn Met Ile Pro Gly Ser Pro Gly Ser Thr Glu Leu Glu Gly Gly
 865 870 875 880
 Phe Ser Arg Gln Arg Lys Arg Lys Leu Ser Phe Arg Arg Arg Thr Asp
 885 890 895
 Lys Asp Thr Glu Gln Pro Gly Glu Val Ser Ala Leu Gly Pro Gly Arg
 900 905 910
 Ala Gly Ala Gly Pro Ser Ser Arg Gly Arg Pro Gly Gly Pro Trp Gly
 915 920 925
 Glu Ser Pro Ser Ser Gly Pro Ser Ser Pro Glu Ser Ser Glu Asp Glu
 930 935 940
 Gly Pro Gly Arg Ser Ser Ser Pro Leu Arg Leu Val Pro Phe Ser Ser
 945 950 955 960
 Pro Arg Pro Pro Gly Glu Pro Pro Gly Gly Glu Pro Leu Met Glu Asp
 965 970 975
 Cys Glu Lys Ser Ser Asp Thr Cys Asn Pro Leu Ser Gly Ala Phe Ser
 980 985 990
 Gly Val Ser Asn Ile Phe Ser Phe Trp Gly Asp Ser Arg Gly Arg Gln
 995 1000 1005
 Tyr Gln Glu Leu Pro Arg Cys Pro Ala Pro Thr Pro Ser Leu Leu Asn
 1010 1015 1020
 Ile Pro Leu Ser Ser Pro Gly Arg Arg Pro Arg Gly Asp Val Glu Ser
 1025 1030 1035 1040
 Arg Leu Asp Ala Leu Gln Arg Gln Leu Asn Arg Leu Glu Thr Arg Leu
 1045 1050 1055
 Ser Ala Asp Met Ala Thr Val Leu Gln Leu Leu Gln Arg Gln Met Thr
 1060 1065 1070
 Leu Val Pro Pro Ala Tyr Ser Ala Val Thr Thr Pro Gly Pro Gly Pro
 1075 1080 1085
 Thr Ser Thr Ser Pro Leu Leu Pro Val Ser Pro Leu Pro Thr Leu Thr
 1090 1095 1100
 Leu Asp Ser Leu Ser Gln Val Ser Gln Phe Met Ala Cys Glu Glu Leu
 1105 1110 1115 1120
 Pro Pro Gly Ala Pro Glu Leu Pro Gln Glu Gly Pro Thr Arg Arg Leu
 1125 1130 1135
 Ser Leu Pro Gly Gln Leu Gly Ala Leu Thr Ser Gln Pro Leu His Arg
 1140 1145 1150
 His Gly Ser Asp Pro Gly Ser
 1155

<210> 13
 <211> 391
 <212> PRT
 <213> Rattus norvegicus

<400> 13

Met	Gly	Ala	Ser	Glu	Arg	Ser	Val	Phe	Arg	Val	Leu	Ile	Arg	Ala	Leu	1	5	10	15
Thr	Glu	Arg	Met	Phe	Lys	His	Leu	Arg	Arg	Trp	Phe	Ile	Thr	His	Ile	20	25	30	
Phe	Gly	Arg	Ser	Arg	Gln	Arg	Ala	Arg	Leu	Val	Ser	Lys	Glu	Gly	Arg	35	40	45	
Cys	Asn	Ile	Glu	Phe	Gly	Asn	Val	Asp	Ala	Gln	Ser	Arg	Phe	Ile	Phe	50	55	60	
Phe	Val	Asp	Ile	Trp	Thr	Thr	Val	Leu	Asp	Leu	Lys	Trp	Arg	Tyr	Lys	65	70	75	80
Met	Thr	Val	Phe	Ile	Thr	Ala	Phe	Leu	Gly	Ser	Trp	Phe	Leu	Phe	Gly	85	90	95	
Leu	Leu	Trp	Tyr	Val	Val	Ala	Tyr	Val	His	Lys	Asp	Leu	Pro	Glu	Phe	100	105	110	
Tyr	Pro	Pro	Asp	Asn	Arg	Thr	Pro	Cys	Val	Glu	Asn	Ile	Asn	Gly	Met	115	120	125	
Thr	Ser	Ala	Phe	Leu	Phe	Ser	Leu	Glu	Thr	Gln	Val	Thr	Ile	Gly	Tyr	130	135	140	
Gly	Phe	Arg	Phe	Val	Thr	Glu	Gln	Cys	Ala	Thr	Ala	Ile	Phe	Leu	Leu	145	150	155	160
Ile	Phe	Gln	Ser	Ile	Leu	Gly	Val	Ile	Ile	Asn	Ser	Phe	Met	Cys	Gly	165	170	175	
Ala	Ile	Leu	Ala	Lys	Ile	Ser	Arg	Pro	Lys	Lys	Arg	Ala	Lys	Thr	Ile	180	185	190	
Thr	Phe	Ser	Lys	Asn	Ala	Val	Ile	Ser	Lys	Arg	Gly	Gly	Lys	Leu	Cys	195	200	205	
Leu	Leu	Ile	Arg	Val	Ala	Asn	Leu	Arg	Lys	Ser	Leu	Leu	Ile	Gly	Ser	210	215	220	
His	Ile	Tyr	Gly	Lys	Leu	Leu	Lys	Thr	Thr	Ile	Thr	Pro	Glu	Gly	Glu	225	230	235	240
Thr	Ile	Ile	Leu	Asp	Gln	Thr	Asn	Ile	Asn	Phe	Val	Val	Asp	Ala	Gly	245	250	255	
Asn	Glu	Asn	Leu	Phe	Phe	Ile	Ser	Pro	Leu	Thr	Ile	Tyr	His	Ile	Ile	260	265	270	
Asp	His	Asn	Ser	Pro	Phe	Phe	His	Met	Ala	Ala	Glu	Thr	Leu	Ser	Gln	275	280	285	

Gln Asp Phe Glu Leu Val Val Phe Leu Asp Gly Thr Val Glu Ser Thr
 290 295 300

Ser Ala Thr Cys Gln Val Arg Thr Ser Tyr Val Pro Glu Glu Val Leu
 305 310 315 320

Trp Gly Tyr Arg Phe Val Pro Ile Val Ser Lys Thr Lys Glu Gly Lys
 325 330 335

Tyr Arg Val Asp Phe His Asn Phe Gly Lys Thr Val Glu Val Glu Thr
 340 345 350

Pro His Cys Ala Met Cys Leu Tyr Asn Glu Lys Asp Ala Arg Ala Arg
 355 360 365

Met Lys Arg Gly Tyr Asp Asn Pro Asn Phe Val Leu Ser Glu Val Asp
 370 375 380

Glu Thr Asp Asp Thr Gln Met
 385 390

<210> 14

<211> 407

<212> PRT

<213> Homo sapiens

<400> 14

Met Asp Gln Asp Val Glu Ser Pro Val Ala Ile His Gln Pro Lys Leu
 1 5 10 15

Pro Lys Gln Ala Arg Asp Asp Leu Pro Arg His Ile Ser Arg Asp Arg
 20 25 30

Thr Lys Arg Lys Ile Gln Arg Tyr Val Arg Lys Asp Gly Lys Cys Asn
 35 40 45

Val His His Gly Asn Val Arg Glu Thr Tyr Arg Tyr Leu Thr Asp Ile
 50 55 60

Phe Thr Thr Leu Val Asp Leu Lys Trp Arg Phe Asn Leu Leu Ile Phe
 65 70 75 80

Val Met Val Tyr Thr Val Thr Trp Leu Phe Phe Gly Met Ile Trp Trp
 85 90 95

Leu Ile Ala Tyr Ile Arg Gly Asp Met Asp His Ile Glu Asp Ser Pro
 100 105 110

Trp Thr Pro Cys Val Thr Asn Leu Asn Gly Phe Val Ser Ala Phe Leu
 115 120 125

Phe Ser Ile Glu Thr Glu Thr Thr Ile Gly Tyr Gly Tyr Arg Val Ile
 130 135 140

Thr Asp Lys Cys Pro Glu Gly Ile Ile Leu Leu Leu Ile Gln Ser Val
 145 150 155 160

Leu Gly Ser Ile Val Asn Ala Phe Met Val Gly Cys Met Phe Val Lys
 165 170 175

Ile Ser Gln Pro Lys Lys Arg Ala Glu Thr Leu Val Phe Ser Thr His
 180 185 190
 Ala Val Ile Ser Met Arg Asp Gly Lys Leu Cys Leu Met Phe Arg Val
 195 200 205
 Gly Asp Leu Arg Asn Ser His Ile Val Glu Ala Ser Ile Arg Ala Lys
 210 215 220
 Leu Ile Lys Ser Lys Gln Thr Ser Glu Gly Glu Phe Ile Pro Leu Asn
 225 230 235 240
 Gln Thr Asp Ile Asn Val Gly Tyr Tyr Thr Gly Asp Asp Arg Leu Phe
 245 250 255
 Leu Val Ser Pro Leu Ile Ile Ser His Glu Ile Asn Gln Gln Ser Pro
 260 265 270
 Phe Trp Glu Ile Ser Lys Ala Gln Leu Pro Lys Glu Glu Leu Glu Ile
 275 280 285
 Val Val Ile Leu Glu Gly Met Val Glu Ala Thr Gly Met Thr Cys Gln
 290 295 300
 Ala Arg Ser Ser Tyr Ile Thr Ser Glu Ile Leu Trp Gly Tyr Arg Phe
 305 310 315 320
 Thr Pro Val Leu Thr Leu Glu Asp Gly Phe Tyr Glu Val Asp Tyr Asn
 325 330 335
 Ser Phe His Glu Thr Tyr Glu Thr Ser Thr Pro Ser Leu Ser Ala Lys
 340 345 350
 Glu Leu Ala Glu Leu Ala Ser Arg Ala Glu Leu Pro Leu Ser Trp Ser
 355 360 365
 Val Ser Ser Lys Leu Asn Gln His Ala Glu Leu Glu Thr Glu Glu Glu
 370 375 380
 Glu Lys Asn Leu Glu Glu Gln Thr Glu Arg Asn Gly Asp Val Ala Asn
 385 390 395 400
 Leu Glu Asn Glu Ser Lys Val
 405

<210> 15

<211> 6

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence:channel protein
 central pore signature sequence

<400> 15

Thr Val Gly Tyr Gly Asp

1

5

<210> 16
 <211> 160
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:mutated
 prokaryotic kcsa potassium channel protein of
 Streptomyces lividans

<400> 16
 Met Pro Pro Met Leu Ser Gly Leu Leu Ala Arg Leu Val Lys Leu Leu
 1 5 10 15
 Leu Gly Arg His Gly Ser Ala Leu His Trp Arg Ala Ala Gly Ala Ala
 20 25 30
 Thr Val Leu Leu Val Ile Val Leu Leu Ala Gly Ser Tyr Leu Ala Val
 35 40 45
 Leu Ala Glu Arg Gly Ala Pro Gly Ala Ala Leu Ile Ser Tyr Pro Asp
 50 55 60
 Ala Leu Trp Trp Ser Val Glu Thr Ala Thr Thr Val Gly Tyr Gly Asp
 65 70 75 80
 Leu Tyr Pro Val Thr Leu Trp Gly Arg Leu Val Ala Val Val Val Met
 85 90 95
 Val Ala Gly Ile Thr Ser Phe Gly Leu Val Thr Ala Ala Leu Ala Thr
 100 105 110
 Trp Phe Val Gly Arg Glu Gln Glu Arg Arg Gly His Phe Val Arg His
 115 120 125
 Ser Glu Lys Ala Ala Glu Glu Ala Tyr Thr Arg Thr Thr Arg Ala Leu
 130 135 140
 His Glu Arg Phe Asp Arg Leu Glu Arg Met Leu Asp Asp Asn Arg Arg
 145 150 155 160

<210> 17
 <211> 1161
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:nucleic acid
 encoding mutated prokaryotic kcsa potassium
 channel protein of Streptomyces lividans

<400> 17
 gcatgctggc tcctttggga tcgatccgtc cggttcttct ccggccgggc acctctcgaa 60
 ggtgacgctg tcgccgacga gccaccgaca tccgaccgac agcccccgac agcgctccta 120
 cgcggtgccg acatgacacc gacaccgcag gtcggacgac gggggctcag gcgcgacggg 180
 cgcggtacac gacggccgta ccgccgcgac ggcgagcacc gccgcgccgc cgaggagtgg 240
 ccgaaggagt gaagatcggg tacggaccgt aaaggagtac ctggcgcacc ggcgcgttgt 300
 cgcacgtcgc tcccgccggg tggcggagca tgccaccat gctgtccggg cttctggcca 360
 gattggtcaa actgctgctc gggcgccacg gcagtgcgct gcactggagg gccgcgggtg 420
 ccgcgacggt cctcctggtg atcgtcctcc tcgcgggctc gtacttggcc gtccctggctg 480

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agcgcggcgc accggggcgc gcgctgatct cgtatccgga cgcgctgtgg tggtcctgtg 540
agaccgcgac gaccgtcggc tacggcgacc tgtaccccggt gactctgtgg ggccggctcg 600
tgcccggtgg ggtgatggtc gccgggatca ctccttcgg tctggtgacc gccgcgctgg 660
ccacctgggt cgtcggccgg gaacaagagc gccggggcca ctctgtgagc cactccgaga 720
aggccgccga ggaggcgtag acgcggacga cccggggcgt gcacgagcgt ttcgaccgtt 780
tgagcgcaat gctcgacgac aaccgccggt gactccgccg gtgaccgccc gagcgaggcc 840
gcaccgatga gtctgcggcg gttgtgcggt ctaccgcgtc acgaaggag cgaccatgc 900
gcaagatcat catttgacg ttcttgacgc tggacggcgt catgcaggcg ccgggcggcc 960
cggacgagga cgccgagagc ggcttcgaac acggcggtcg gcagaagccg gtggacgacg 1020
acgaggtcgg cacggccatc gccggctggg acgaggactc cgacgccatg ctctcggcc 1080
gcaagaccta cgacatcttc gcgtcgtact ggccgaccgc cgaccccgac aaccgttca 1140
cccatcggat gaacagcatg c                                     1161

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<210> 18

<211> 261

<212> PRT

<213> Homo sapiens

<400> 18

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Ile Tyr Tyr Ala Ile Ser Lys Ser Ile Gly Phe Gly Val Asp Thr Trp
 1             5             10             15

Val Tyr Pro Asn Ile Thr Asp Pro Glu Tyr Gly Tyr Leu Ala Arg Glu
      20             25             30

Tyr Ile Tyr Cys Leu Tyr Trp Ser Thr Leu Thr Leu Thr Thr Ile Gly
      35             40             45

Glu Thr Pro Pro Pro Val Lys Asp Glu Glu Tyr Leu Phe Val Ile Phe
      50             55             60

Asp Phe Leu Ile Gly Val Leu Ile Phe Ala Thr Ile Val Gly Asn Val
      65             70             75             80

Gly Ser Met Ile Ser Asn Met Asn Ala Thr Arg Ala Glu Phe Gln Ala
      85             90             95

Lys Ile Asp Ala Val Lys His Tyr Met Gln Phe Arg Lys Val Ser Lys
      100            105            110

Gly Met Glu Ala Lys Val Ile Arg Trp Phe Asp Tyr Leu Trp Thr Asn
      115            120            125

Lys Lys Thr Val Asp Glu Arg Glu Ile Leu Lys Asn Leu Pro Ala Lys
      130            135            140

Leu Arg Ala Glu Ile Ala Ile Asn Val His Leu Ser Thr Leu Lys Lys
      145            150            155            160

Val Arg Ile Phe His Asp Cys Glu Ala Gly Leu Leu Val Glu Leu Val
      165            170            175

Leu Lys Leu Arg Pro Gln Val Phe Ser Pro Gly Asp Tyr Ile Cys Arg
      180            185            190

Lys Gly Asp Ile Gly Lys Glu Met Tyr Ile Ile Lys Glu Gly Lys Leu
      195            200            205

Ala Val Val Ala Asp Asp Gly Val Thr Gln Tyr Ala Leu Leu Ser Ala
      210            215            220

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Gly Ser Cys Phe Gly Glu Ile Ser Ile Leu Asn Ile Lys Gly Ser Lys
 225 230 235 240

Met Gly Asn Arg Arg Thr Ala Asn Ile Arg Ser Leu Gly Tyr Ser Asp
 245 250 255

Leu Phe Cys Leu Ser
 260

<210> 19
 <211> 690
 <212> PRT
 <213> Homo sapiens

<400> 19
 Met Lys Leu Ser Met Lys Asn Asn Ile Ile Asn Thr Gln Gln Ser Phe
 1 5 10 15

Val Thr Met Pro Asn Val Ile Val Pro Asp Ile Glu Lys Glu Ile Arg
 20 25 30

Arg Met Glu Asn Gly Ala Cys Ser Ser Phe Ser Glu Asp Asp Asp Ser
 35 40 45

Ala Tyr Thr Ser Glu Glu Ser Glu Asn Glu Asn Pro His Ala Arg Gly
 50 55 60

Ser Phe Ser Tyr Lys Ser Leu Arg Lys Gly Gly Pro Ser Gln Arg Glu
 65 70 75 80

Gln Tyr Leu Pro Gly Ala Ile Ala Ile Phe Asn Val Asn Asn Ser Ser
 85 90 95

Asn Lys Asp Gln Glu Pro Glu Glu Lys Lys Lys Lys Lys Lys Glu Lys
 100 105 110

Lys Ser Lys Ser Asp Asp Lys Asn Glu Asn Lys Asn Asp Pro Glu Lys
 115 120 125

Lys Lys Lys Lys Lys Asp Lys Glu Lys Lys Lys Lys Glu Glu Lys Ser
 130 135 140

Lys Asp Lys Lys Glu His His Lys Lys Glu Val Val Val Ile Asp Pro
 145 150 155 160

Ser Gly Asn Thr Tyr Tyr Asn Trp Leu Phe Cys Ile Thr Leu Pro Val
 165 170 175

Met Tyr Asn Trp Thr Met Val Ile Ala Arg Ala Cys Phe Asp Glu Leu
 180 185 190

Gln Ser Asp Tyr Leu Glu Tyr Trp Leu Ile Leu Asp Tyr Val Ser Asp
 195 200 205

Ile Val Tyr Leu Ile Asp Met Phe Val Arg Thr Arg Thr Gly Tyr Leu
 210 215 220

Glu Gln Gly Leu Leu Val Lys Glu Glu Leu Lys Leu Ile Asn Lys Tyr
 225 230 235 240

Lys Ser Asn Leu Gln Phe Lys Leu Asp Val Leu Ser Leu Ile Pro Thr
 245 250 255
 Asp Leu Leu Tyr Phe Lys Leu Gly Trp Asn Tyr Pro Glu Ile Arg Leu
 260 265 270
 Asn Arg Leu Leu Arg Phe Ser Arg Met Phe Glu Phe Phe Gln Arg Thr
 275 280 285
 Glu Thr Arg Thr Asn Tyr Pro Asn Ile Phe Arg Ile Ser Asn Leu Val
 290 295 300
 Met Tyr Ile Val Ile Ile Ile His Trp Asn Ala Cys Val Phe Tyr Ser
 305 310 315 320
 Ile Ser Lys Ala Ile Gly Phe Gly Asn Asp Thr Trp Val Tyr Pro Asp
 325 330 335
 Ile Asn Asp Pro Glu Phe Gly Arg Leu Ala Arg Lys Tyr Val Tyr Ser
 340 345 350
 Leu Tyr Trp Ser Thr Leu Thr Leu Thr Thr Ile Gly Glu Thr Pro Pro
 355 360 365
 Pro Val Arg Asp Ser Glu Tyr Val Phe Val Val Val Asp Phe Leu Ile
 370 375 380
 Gly Val Leu Ile Phe Ala Thr Ile Val Gly Asn Ile Gly Ser Met Ile
 385 390 395 400
 Ser Asn Met Asn Ala Ala Arg Ala Glu Phe Gln Ala Arg Ile Asp Ala
 405 410 415
 Ile Lys Gln Tyr Met His Phe Arg Asn Val Ser Lys Asp Met Glu Lys
 420 425 430
 Arg Val Ile Lys Trp Phe Asp Tyr Leu Trp Thr Asn Lys Lys Thr Val
 435 440 445
 Asp Glu Lys Glu Val Leu Lys Tyr Leu Pro Asp Lys Leu Arg Ala Glu
 450 455 460
 Ile Ala Ile Asn Val His Leu Asp Thr Leu Lys Lys Val Arg Ile Phe
 465 470 475 480
 Ala Asp Cys Glu Ala Gly Leu Leu Val Glu Leu Val Leu Lys Leu Gln
 485 490 495
 Pro Gln Val Tyr Ser Pro Gly Asp Tyr Ile Cys Lys Lys Gly Asp Ile
 500 505 510
 Gly Arg Glu Met Tyr Ile Ile Lys Glu Gly Lys Leu Ala Val Val Ala
 515 520 525
 Asp Asp Gly Val Thr Gln Phe Val Val Leu Ser Asp Gly Ser Thr Phe
 530 535 540
 Gly Glu Ile Ser Ile Leu Asn Ile Lys Gly Ser Lys Ala Gly Asn Arg
 545 550 555 560

Arg Thr Ala Asn Ile Lys Ser Ile Gly Tyr Ser Asp Leu Phe Cys Leu
565 570 575

Ser Lys Asp Asp Leu Met Glu Ala Leu Thr Glu Tyr Pro Asp Ala Lys
580 585 590

Thr Met Leu Glu Glu Lys Gly Lys Gln Ile Leu Met Lys Asp Gly Leu
595 600 605

Leu Asp Leu Asn Ile Ala Asn Ala Gly Ser Asp Pro Lys Asp Leu Glu
610 615 620

Glu Lys Val Thr Arg Met Glu Gly Ser Val Asp Leu Leu Gln Thr Arg
625 630 635 640

Phe Ala Arg Ile Leu Ala Glu Tyr Glu Ser Met Gln Gln Lys Leu Lys
645 650 655

Gln Arg Leu Thr Lys Val Glu Lys Phe Leu Lys Pro Leu Ile Asp Thr
660 665 670

Glu Phe Ser Ser Ile Glu Gly Pro Trp Ser Glu Ser Gly Pro Ile Asp
675 680 685

Ser Thr
690

<210> 20

<211> 40

<212> PRT

<213> *Drosophila melanogaster*

<400> 20

Ala Glu Ala Gly Ser Glu Asn Ser Phe Phe Lys Ser Ile Pro Asp Ala
1 5 10 15

Phe Trp Trp Ala Val Val Thr Met Thr Thr Val Gly Tyr Gly Asp Met
20 25 30

Thr Pro Val Gly Phe Trp Gly Lys
35 40

<210> 21

<211> 40

<212> PRT

<213> *Rattus norvegicus*

<400> 21

Ala Asn His Thr Pro Cys Val Glu Asn Ile Asn Gly Met Thr Ser Ala
1 5 10 15

Phe Leu Phe Ser Leu Glu Thr Gln Val Thr Ile Gly Tyr Gly Phe Arg
20 25 30

Cys Val Thr Glu Gln Cys Ala Thr
35 40

<210> 22
 <211> 42
 <212> PRT
 <213> *Methanococcus jannaschii*

<400> 22
 Glu Ser Val Ile Leu Met Thr Val Glu Gly Trp Asp Phe Phe Thr Ala
 1 5 10 15
 Phe Tyr Thr Ala Val Val Thr Ile Ser Thr Val Gly Tyr Gly Asp Tyr
 20 25 30
 Thr Pro Gln Thr Phe Leu Gly Lys Leu Ser
 35 40

<210> 23
 <211> 40
 <212> PRT
 <213> *Streptomyces lividans*

<400> 23
 Val Leu Ala Glu Arg Pro Gly Ala Gln Leu Ile Thr Tyr Pro Arg Ala
 1 5 10 15
 Leu Trp Trp Ser Val Glu Thr Ala Thr Thr Val Gly Tyr Gly Asp Leu
 20 25 30
 Tyr Pro Val Thr Leu Trp Gly Arg
 35 40

<210> 24
 <211> 5
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:channel protein
 central pore signature sequence

<400> 24
 Thr Val Gly Tyr Gly
 1 5

<210> 25
 <211> 58
 <212> PRT
 <213> *Streptomyces lividans*

<400> 25
 Thr Tyr Pro Arg Ala Leu Trp Trp Ser Val Glu Thr Ala Thr Thr Val
 1 5 10 15
 Gly Tyr Gly Asp Leu Tyr Pro Val Thr Leu Trp Gly Arg Leu Val Ala
 20 25 30
 Val Val Val Met Val Ala Gly Ile Thr Ser Phe Gly Leu Val Thr Ala
 35 40 45

Ala Leu Ala Thr Trp Phe Val Gly Arg Glu
 50 55

<210> 26
 <211> 58
 <212> PRT
 <213> Escherichia coli

<400> 26
 Ser Leu Met Thr Ala Phe Tyr Phe Ser Ile Glu Thr Met Ser Thr Val
 1 5 10 15

Gly Tyr Gly Asp Ile Val Pro Val Ser Glu Ser Ala Arg Leu Phe Thr
 20 25 30

Ile Ser Val Ile Ile Ser Gly Ile Thr Val Phe Ala Thr Ser Met Thr
 35 40 45

Ser Ile Phe Gly Pro Leu Ile Arg Gly Gly
 50 55

<210> 27
 <211> 58
 <212> PRT
 <213> Drosophila melanogaster

<400> 27
 Ser Ile Pro Asp Ala Phe Trp Trp Ala Val Val Thr Met Thr Thr Val
 1 5 10 15

Gly Tyr Gly Asp Met Thr Pro Val Gly Phe Trp Gly Lys Ile Val Gly
 20 25 30

Ser Leu Cys Val Ile Ala Gly Val Leu Thr Ile Ala Leu Pro Val Pro
 35 40 45

Val Ile Val Ser Asn Phe Asn Tyr Phe Tyr
 50 55

<210> 28
 <211> 58
 <212> PRT
 <213> Homo sapiens

<400> 28
 Ser Ile Pro Asp Ala Phe Trp Trp Ala Val Val Ser Met Thr Thr Val
 1 5 10 15

Gly Tyr Gly Asp Met Tyr Pro Val Thr Ile Gly Gly Lys Ile Val Gly
 20 25 30

Ser Leu Cys Ala Ile Ala Gly Val Leu Thr Ile Ala Leu Pro Val Pro
 35 40 45

Val Ile Val Ser Asn Phe Asn Tyr Phe Tyr
 50 55

<210> 29
 <211> 58
 <212> PRT
 <213> Homo sapiens

<400> 29
 Ser Ile Pro Ala Ser Phe Trp Trp Ala Thr Ile Thr Met Thr Thr Val
 1 5 10 15
 Gly Tyr Gly Asp Ile Tyr Pro Lys Thr Leu Leu Gly Lys Ile Val Gly
 20 25 30
 Gly Leu Cys Cys Ile Ala Gly Val Leu Val Ile Ala Leu Pro Ile Pro
 35 40 45
 Ile Ile Val Asn Asn Phe Ser Glu Phe Tyr
 50 55

<210> 30
 <211> 58
 <212> PRT
 <213> Paramecium tetraurelia

<400> 30
 Gln Tyr Leu His Ser Leu Tyr Trp Ser Ile Ile Thr Met Thr Thr Ile
 1 5 10 15
 Gly Tyr Gly Asp Ile Thr Pro Gln Asn Leu Arg Glu Arg Val Phe Ala
 20 25 30
 Val Gly Met Ala Leu Ser Ala Val Gly Val Phe Gly Tyr Ser Ile Gly
 35 40 45
 Asn Ile Asn Ser Ile Tyr Ala Glu Trp Ser
 50 55

<210> 31
 <211> 58
 <212> PRT
 <213> Caenorhabditis elegans

<400> 31
 Ser Ile Pro Leu Gly Leu Trp Trp Ala Ile Cys Thr Met Thr Thr Val
 1 5 10 15
 Gly Tyr Gly Asp Met Thr Pro His Thr Ser Phe Gly Arg Leu Val Gly
 20 25 30
 Ser Leu Cys Ala Val Met Gly Val Leu Thr Ile Ala Leu Pro Val Pro
 35 40 45
 Val Ile Val Ser Asn Phe Ala Met Phe Tyr
 50 55

<210> 32
 <211> 58
 <212> PRT
 <213> Mus musculus

<400> 32

Thr Tyr Trp Glu Cys Val Tyr Leu Leu Met Val Thr Met Ser Thr Val
 1 5 10 15

Gly Tyr Gly Asp Val Tyr Ala Lys Thr Thr Leu Gly Arg Leu Phe Met
 20 25 30

Val Phe Phe Ile Leu Gly Gly Leu Ala Met Phe Ala Ser Tyr Val Pro
 35 40 45

Glu Ile Ile Glu Leu Ile Gly Asn Arg Lys
 50 55

<210> 33

<211> 58

<212> PRT

<213> Homo sapiens

<400> 33

Asn Phe Leu Gly Ala Met Trp Leu Ile Ser Ile Thr Phe Leu Ser Ile
 1 5 10 15

Gly Tyr Gly Asp Met Val Pro His Thr Tyr Cys Gly Lys Gly Val Cys
 20 25 30

Leu Leu Thr Gly Ile Met Gly Ala Gly Cys Thr Ala Leu Val Val Ala
 35 40 45

Val Val Ala Arg Lys Leu Glu Leu Thr Lys
 50 55

<210> 34

<211> 58

<212> PRT

<213> Arabidopsis thaliana

<400> 34

Arg Tyr Val Thr Ser Met Tyr Trp Ser Ile Thr Thr Leu Thr Thr Val
 1 5 10 15

Gly Tyr Gly Asp Leu His Pro Val Asn Thr Lys Glu Met Ile Phe Asp
 20 25 30

Ile Phe Tyr Met Leu Phe Asn Leu Gly Leu Thr Ala Tyr Leu Ile Gly
 35 40 45

Asn Met Thr Asn Leu Val Val His Gly Thr
 50 55

<210> 35

<211> 58

<212> PRT

<213> Homo sapiens

<400> 35

Lys Tyr Val Thr Ala Leu Tyr Phe Thr Phe Ser Ser Leu Thr Ser Val
 1 5 10 15

Gly Glu Thr Pro Pro Pro Val Lys Asp Glu Glu Tyr Leu Phe Val Ile
20 25 30

Phe Asp Phe Leu Ile Gly Val Leu Ile Phe Ala Thr Ile Val Gly Asn
 35 40 45

Val Gly Ser Met Ile Ser Asn Met Asn
 50 55

<210> 39
 <211> 57
 <212> PRT
 <213> Homo sapiens

<400> 39
 Lys Tyr Val Tyr Ser Leu Tyr Trp Ser Thr Leu Thr Leu Thr Thr Ile
 1 5 10 15

Gly Glu Thr Pro Pro Pro Val Arg Asp Ser Glu Tyr Val Phe Val Val
 20 25 30

Val Asp Phe Leu Ile Gly Val Leu Ile Phe Ala Thr Ile Val Gly Asn
 35 40 45

Ile Gly Ser Met Ile Ser Asn Met Asn
 50 55

<210> 40
 <211> 4
 <212> PRT
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence:selectivity
 filter sequence

<400> 40
 Val Gly Tyr Gly
 1

<210> 41
 <211> 36
 <212> PRT
 <213> Streptomyces lividans

<400> 41
 Glu Arg Gly Ala Pro Gly Ala Gln Leu Ile Thr Tyr Pro Arg Ala Leu
 1 5 10 15

Trp Trp Ser Val Glu Thr Ala Thr Thr Val Gly Tyr Gly Asp Leu Tyr
 20 25 30

Pro Val Thr Leu
 35

<210> 42
 <211> 36
 <212> PRT
 <213> Drosophila melanogaster

<400> 42

Glu Ala Gly Ser Glu Asn Ser Phe Phe Lys Ser Ile Pro Asp Ala Phe
1 5 10 15

Trp Trp Ala Val Val Thr Met Thr Thr Val Gly Tyr Gly Asp Met Thr
20 25 30

Pro Val Gly Phe
35